



2nd CIE EXPERT SYMPOSIUM on LED MEASUREMENT

**Standard methods for specifying and measuring LED
and LED Cluster characteristics**

**May 10 - 12, 2001
Holiday Inn, Gaithersburg, Maryland USA**

Final Program

Symposium Co-chairs
J Schanda
Y Ohno

Tutorial
10 May 2001

Thursday, 10 May 2001 (Washingtonian Room)		
8:00 - 9:00	Registration / coffee and danish	
9:00 - 9:15	Introduction to the Tutorial	
9:15 - 10:25	Introduction to photometry and radiometry of LEDs	Yoshi Ohno
10:25 - 10:50	Coffee break	
10:50 - 12:00	Introduction to spectroradiometry and colorimetry of LEDs	Teresa Goodman
12:00 - 1:30	Lunch break	
1:30 - 3:00	Uncertainty principles and their application to LED measurement	Georg Sauter
3:00 - 3:30	Coffee break	
3:30 - 4:30	CIE work on LED measurement	Kathleen Muray
4:30 - 5:00	Visual aspects connected with LED measurement	Janos Schanda
5:00 - 5:30	General discussion	Moderator: Goodman

2nd CIE Expert Symposium on LED Measurement

Symposium 11 - 12 May 2001

Friday, 11 May 2001 (Washingtonian Room)			
8:00 - 9:00	Registration / coffee and danish		
9:00 - 9:15	Introduction to the Symposium		J. Schanda, Y. Ohno
Session 1 - Measurement of individual LEDs			Chair: T. Goodman
9:15 - 9:55	Keynote paper	State of the Art of LED Technologies	G. Müller
9:55 - 10:20	Coffee break		
10:20 - 11:00	Invited paper	The Emergence of Organic Light Emitting Diodes (OLEDs) as a Future Solid State Light Source	S. Johnson
11:00 - 11:20		Problems and Requirements of the Optical Characterization of LEDs	T. Nägele
11:20 - 11:40		Intercomparison of Spectroradiometric and Photometric Measurements of Light Emitting Diode Luminous Intensity	R.L. Austin and C.R. Lustenberger
11:40 - 12:00		Round Robin LED Photometry Test in Japan	K. Suzuki, et al.
12:00 - 1:30	Lunch break		
		Afternoon session 1	Chair: G. Sauter
1:30 - 2:10	Invited paper	LED Measurement Instrumentation	R. Young
2:10 - 2:30		Light Emitting Diode Standards	J. Schanda, G. Schanda and K. Muray
2:30 - 2:50		Luminous Intensity Measurements of Light Emitting Diodes at NIST	C.C. Miller and Y. Ohno
2:50 - 3:20	Coffee break		
		Afternoon session 2	Chair: Y. Ohno
3:20 - 4:00	Invited paper	Measurement Challenges in LED Production	G. Heidel and W. Marchl
4:00 - 4:20		Quantifying Photometric Spectral Mismatch Uncertainties in LED Measurements	R. Young, K. Muray, and C. Jones
4:20 - 4:40		Luminous Flux Calibration of LEDs at NIST	C.C. Miller and Y. Ohno
4:40 - 5:20		Open discussion	
5:20 - 7:00	Tabletop exhibit		
6:00 - 7:00	Cocktail time (Walker/Whetstone Ballroom)		
7:00 -	Dinner (Walker/Whetstone Ballroom)		

Saturday, May 12 (Washingtonian Room)			
8:00 - 9:00	Coffee and danish		
Session 2 - Spectral measurement of LEDs			Chair: K. Muray
9:00 - 9:40	Invited paper	Development of White LEDs in Japan	K. Kohmoto
9:40 - 10:00		Comparison Measurements of LEDs: Spectral Power Distribution	K. Muray, Y. Ohno, J. Schanda, B. Kranicz,
10:00 - 10:20		Spectroradiometer Characterization for Colorimetry of LEDs	Y. Ohno and B. Kránicz
10:20 - 10:50	Coffee break		
10:50 - 11:10		Deconvolution for Spectral Data of LEDs	B. Kránicz and Y. Ohno
11:10 - 11:30		Colour Rendering Properties of LED Sources	T. Tarczali, P. Bodrogi and J. Schanda
11:30 - 12:00		Open discussion	
12:00 - 1:30	Lunch break		
Session 3 - Measurement of LED clusters and arrays and other applications			Chair: C. Jones
1:30 - 2:00	Invited paper	On the Use of Clusters of Light Emitting Diodes (LEDs) in Transportation Signaling Lights	C.K. Andersen
2:00 - 2:30	Invited paper	Use of LED Clusters for Signals and Their Measurement	S.E. Jenkins
2:30 - 2:50		Discussion	
2:50 - 3:20	Coffee break		
		Afternoon session 2 (safety issues)	Chair: J. Schanda
3:20 - 4:00	Invited paper	The Potential Ocular Hazards of LED Emitters	D.H. Sliney and B.E. Stuck
4:00 - 4:20		Laser Source Size as a Function of Distance	W.J. Marshall
4:20 - 4:40		Comparative Optical Radiation Safety Analysis of new LED- Devices and Lamps	W. Horak and R. Neuhaus
4:40 - 4:55		Introducing a CD-ROM on LEDs	C. Lányi, J. Szabó, P. Csuti, A. Pái, and J. Schanda
4:55 - 5:00		Colour matching using LEDs as primaries	A. Borbély and J. Schanda
5:00 - 5:30		Open discussion and Summary	Moderator: J. Schanda
5:30		Closing remarks	